REMARKS AND ARGUMENTS

This amendment is in response to a Final Office Action dated July 8, 2002. This amendment is accompanied by a Petition to Revive an Unintentionally Abandoned Application and the Revival fee.

The final rejection says: *Claims 1~3, 5,7-12,14-15,17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tayloe et al. (US 5,095,500) in view of Bruckert (US 5,596,333).* This rejection is respectfully but most strenuously traversed.

The final rejection continues: *Regarding claims 1-3, 14, 15, Tayloe teaches a cellular communication system that supports a call with mobile station in a sector of a cell (fig. 2); a base station antenna for supporting the call between a .mobile unit 100 and the base station 101, 106, 111 (fig. 1), comprising: means for detecting an event associated with the call (col. 4, line 51 through col. 5, line 1);*

Tayloe col. 4 line 51 to col. 5 line 1 reads:

> **It will be appreciated by those skilled in the art that every call contains valuable information regarding the actual characteristics of the radio coverage at the location of a mobile unit. Therefore, information such as, but not limited to, transmitter power, transmitter frequency, mobile unit signal strength, mobile unit bit-error-rate, timeslot utilization, and signal to noise ratios are all relevant parameters that should be evaluated. From this information, specific characteristics concerning the adequacy of existing radio coverage can be deduced. For example, characteristics like: coverage area boundaries, signal strength contours, areas having no electromagnetic coverage, areas having poor signal quality, areas providing poor overlap, areas experiencing high handover failures, areas experiencing electromagnetic interference, traffic density distribution, average timeslot utilization, and average channel holding time are all readily ascertainable from monitoring subscriber calls. (emphasis added).**

Note that the "handover failure rate" is the only call event that is also partly claimed by applicants. Note also that the term "signal strength contours" is a characteristic of the Tayloe system. Signal strength contours are essentially radiation patterns.

The final rejection continues: *means for determining an approximate location (col. 3, lines 46-50); means for mapping the approximate location to the sector (col. 5, lines 18~24); means for incrementing a corresponding event counter associated with the call event and the sector, the corresponding event counter determining a performance metric associated with the sector (col. 6, lines 45-61); means for accumulating the counter during a study period (col. 6, lines 41-48); and means, responsive to the accumulating means for adjusting a radiation pattern of the base station antenna by coupling control signals to the base station antenna in order to provide an improvement of the performance metric (col. 5, lines 33-36 and lines 49-52),*

Column 5 lines 33-65 read:

> Via the terminal 119 and the CRT display 118, a system operator can access base station 101, 106, or 111 and alter various system parameters such as: **transmitter power, transmitter frequency, frequency assignments,** or software algorithms. In addition the OMCU provides the mass storage 120 and necessary computing power to support these operations.
>
> Careful review of FIG. 1 reveals that the evaluation tool 117 is mated with the OMCU. The evaluation tool performs the required statistical analysis and correlation which relates the mobile unit's position with the resultant signal quality. As a function of these actual measurements, the evaluation tool is capable of providing a computer generated representation of the characteristics of the electromagnetic coverage. These representations, graphical or tabular, are presented to the system operator via CRT displays 118 or 122. Armed with this information, the system operator can easily plan, diagnose, or optimize the electromagnetic coverage of that communication system.
>
> **When corrective actions are required, the system operator can initiate previously mentioned alterations from the OMCU. Hardware specific alterations like: increasing or decreasing antenna height, adding additional base stations, utilizing omni or directional antennae, or varying antenna shaping must be performed in the field.** Upon completion, continuously monitoring subscriber calls within the affected area allows the evaluation tool to update the graphical representations for that areas. These updates, in turn, enables the system operator to quickly and efficiently evaluate the effectiveness of proposed solutions, and make additional changes as required.(emphasis added)

This passage of Tayloe states the only control the system operator at a control terminal has is to increase or decrease power and to change operating frequencies. These actions will change the magnitude of the signal strength, but to change the shape of the signal strength contours a person must visit the antenna location and make physical adjustments to the antenna. Column 5 lines 55-59 detail how a service person goes to an antenna location and physically changes the shape of the signal strength contours. For some reason, the examiner cited passages just above and below the hardware field adjustment description. Perhaps he found the skipped over passages that describe the labor intensive manual adjustment process for adjusting antenna contours irrelevant? Applicants' invention, by using an electronically adjustable array antenna, allows adjustments to be made without service personnel visiting the antenna location in the field. That seems like a very relevant difference.

The final rejection continues: Tayloe only differs from the claimed invention in that the sector also includes sub-sectors.

As presented in the paragraphs immediately above, there are more differences between Tayloe and applicants' claimed invention as claimed in claims 1-3, 14, and 15 than the differences of sub-sectors.

The final rejection continues*: Bruckert teaches that the location of the mobile station is determined within sub-sector of a sector of a cell and uses the antenna structure with narrower beam width than angular width of the sector (col. 3, lines 35-43). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Bruckert to the system of Tayloe in order to reduce the quality of noise and interference.*

It is worth noting that the use of array antennas to form adjustable beam patterns and narrow beam widths was well known when the parent application of Tayloe was filed in 1989.

Such antenna arrays are mentioned in applicants' cited document: The Handbook of Antenna Design by A. W. Rudge et al. published 1986. Yet, Tayloe et al. did not add electronically adjustable array antennas or narrow beam formed sub-sectors to their system to reduce the quality of noise. This is a strong inference that Tayloe teaches against electronically controlling the shape of the "signal strength contours" other than raising or lowering power levels. Teaching against a technological approach is strong evidence of non-obviousness. Another inference is that Tayloe et al. were not motivated to add sub-sectors to their invention to reduce the quality of noise and interference. They must not have found sub sections desirable or obvious. Absent such a motivation, the combination of Tayloe and Bruckert is improper and a prima facie case of obviousness is not established. For all the foregoing reasons, it is respectfully submitted that applicants' claim 1 is substantially different and non-obvious from Tayloe and/or Burckert.

Applicants' claims 2, 3 and 14 depend from claim 1 and are believed to be non-obvious for the same reasons as claim 1.

Applicants' claim 15 is a method claim that parallels the functions of the means-plus-function elements of claim 1 and, like claim 1, is believed to be similarly non-obvious over Tayloe and/or Bruckert. Especially including the last sub-paragraph step of "adjusting a radiation pattern (signal strength contour in Tayloe) of a base station antenna by coupled control signals" to provide an improvement of the performance metric. Thus, claim 15 is believed to be substantially different and non-obvious by the same reasoning as claim 1 is non-obvious.

The final rejection continues: *Regarding claim 5, Tayloe also teaches bit error rate, handover failures (col. 4, lines 51-65).*

Claim 5 has been canceled because claim 5 has been re-written in independent form as new claims 19 and 20 so this rejection must be addressed. Claim 19 has the same elements as claim 5

except the group of events comprises two event types of the four listed in claim 5. Claim 20 depends from claim 19 and adds the remaining two event types of the four in the group of claim 5. The call event types of applicants' claim 19 are: forward frame error rate and reverse frame error rate. The call events of claim 20 are: forward frame error rate, reverse error rate, dropped call and blocked call. This is presenting claims in a better form for analysis, so entry is requested.

The bit error rate of Tayloe is not the same as the frame error rates of applicants' claims 19 and 20. With error correcting codes, bit errors may be correctable, while frame errors when they occur often require re-transmission of the frame of data. The handover failures of Tayloe are different than the dropped call or blocked call of applicants' claim 20 (formerly claim 5). Some calls may be dropped due to handoff errors, but interference or poor signal strength in a non-handoff situation can also cause a dropped call. So, applicants' claims 19 and 20 (formerly claim 5) are substantially different in elements of the claims from Tayloe and/or Bruckert. Because of these differences, it is respectfully submitted that claims 19 and 20 are non-obvious from Tayloe and/or Bruckert.

The final rejection continues: *Regarding claims 7-12,17-18, Tayloe also teaches updating and modifying the updating (col. 5, line 68 through col. 6, line 29).*

What is quickly passed over by the examiner is that claim 7 includes: **means, . . . for adjusting said radiation pattern of said base station antenna with said updated values.** (emphasis added) and from the first sub-paragraph of claim 7, this adjusting is by **control signals**. Thus, claim 7 uses updates to obtain control signals and the control signals are processed and the result is used to modify the radiation pattern (the signal strength contours not just power level adjustment) electronically thereby providing needed radiation pattern/signal strength contours without dispatching worker to the antenna location to make such an adjustment. Thus applicants'

claim 7 not only updates performance data, but also acts on such data to change an antenna radiation pattern without sending a person to the field. These are major differences in wireless telecommunications operations. For these differences, it is respectfully submitted that claim 7 is non-obvious from Tayloe and/or Bruckert. Also, since claim 7 depends on claim 1 and claim 1 is believed to be patentable, claim 7 would then be patentable too.

Claims 8 and 9 depend from claim 7 and are believed to be non-obvious for the same reasons that claim 7 is non-obvious.

Claim 10 is very similar to claim 7, the main difference being that claim 10 has at least one element (predetermined limit) in non-means-plus-function claim format, but still has the element for adjusting the antenna radiation pattern/signal strength contours. Thus, claim 10 is believed to be different and non-obvious from Tayloe and/or Bruckert by the same reasoning used to distinguish claim 7. Further, since claim 10 depends on claim 1 and claim 1 is believed to be patentable, claim 10 should then be patentable too.

Claims 11 and 12 depend on claim 10 and are believed to be patentable because they depend from a patentable claim 10. Base claim 10 is believed to be **non-obvious** because claim 10t depends from claim 1 which is likewise non-obvious.

Claims 17 and 18 are method claims that are steps that parallel the functions of the means-plus-function elements of claims 7 and 10 respectively. Therefore, claims 17 and 18 are believed to be non-obvious for the same reasons claims 7 and 10 are non-obvious. Further, claims 17 and 18 depend from claim 15 and are believed to be non-obvious for the same reasons claim 15 is non-obvious.

The final rejection continues: *claim 4 is rejected under 35 U.S.C. 103{a) as being unpatentable over Tayloe et al. (US 5,095,500) in view of Bruckert (US 5,596,333) as applied to*

claim 1 above and further in view of Ablay et al. (US 5,408,683).

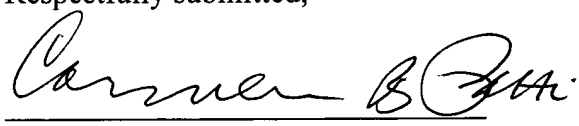
Regarding claim 4, it depends from claim 1 and is believed to be non-obvious for the same reasons that claim 1 is non-obvious.

The final rejection of claim 13 is moot since claim 13 is canceled to simplify issues for this final rejection response and possible appeal.

What is clear is that the argument for or against patentability turns upon the meaning of the words "radiation pattern." Referring to FIG. 5, some of the means for adjusting a radiation pattern is shown. When multiple antennas in close proximity to each other are driven with the same signal only that to some of the antennas the drive signal is delayed (phase shifters (517 and 521) and attenuated (attenuators 516, 520), the shape of the transmitting radiation pattern is changed. No such delay and attenuation devices are shown in Tayloe. Therefore, it is respectfully submitted that Tayloe does not have a means for adjusting a radiation pattern that is responsive to control signals.

Reconsideration of the claims in view of these remarks and amendments is respectfully requested. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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